6-1-2010

Recognizing and Managing Common Crop Disease in South Dakota

Martin A. Draper
South Dakota State University

Darrel Deneke
South Dakota State University

ExEx8005
June 2010 (rev)
Plant Science

SDSU
Extension Extra
South Dakota State University / College of Agriculture & Biological Sciences / USDA

Recognizing and Managing Common Crop Diseases in South Dakota

Martin A. Draper, Extension plant pathologist
Darrell Deneke, Extension integrated pest management coordinator

Diseases of plants may be expressed differently under varying environmental conditions or in various host species. Disease is the outward expression of an infection, yet in some cases there may be no outward evidence of disease. Outward expression may be some deviation from normal growth, change in appearance, or alteration of the quality or value of the crop.

Plant diseases may be caused by biotic agents, infectious microorganisms, or abiotic causes such as chemical deposition, nutrient imbalances, or environmental factors. This publication concentrates on biotic or infectious diseases and provides information on common abiotic problems.

Infectious plant diseases may be caused by fungi, bacteria, viruses, nematodes, or phytoplasmas. Each of these microorganisms has characteristics that can be keyed on in the control or management process. The most common cause of plant diseases are fungi.

Outward indications may be present that indicate there is something wrong with a plant. Most often you observe symptoms of a disease—the reaction of the plant to a pathogen. **Symptoms** are defined as any perceptible change in host structure or function that indicates disease or disorder. Slimy, dark, roots; lodging; holes in the leaves; and blasted heads are all examples of symptoms. The pathogen that is causing the disease may or may not be visible.

Sometimes the pathogen can also be seen. When the pathogen or a structure of the pathogen is present it is referred to as a **sign**. Signs may appear as an ooze, a cottony mass, or sometimes a black or pink mass on the plant. Some types of bacteria, fungi, nematodes, and viruses cause plant diseases. Weather and unfavorable growing conditions may interact with the pathogen to increase or decrease severity of the problem.

The diseases listed here are historically found in South Dakota. Depending on the crop varieties planted or currently prevalent forms of the pathogens, diseases may become more or less important over the years. Occurrence of the diseases listed is reported as widespread, common, fairly common, or rare in South Dakota. The symptoms of each disease are described and the period when the disease is most common is provided for each crop. Be sure to monitor fields between the dates given for the presence of specific diseases.

General control strategies are listed. More specific control measures can be obtained from your local County Extension office or on the Internet at <http://plantsci.sdstate.edu/planthealth/>.

Small Grains (wheat, barley, oats, rye)

LEAF RUST (CROWN RUST ON OATS)……

Puccinia recondita Roberge ex Desmaz. f. sp. *tritici* (Eriks. & E. Henn.) D.M. Henderson (wheat/durum)
P. coronata Corda (oats)
P. hordei G. Otth (barley)
P. recondita Roberge ex Desmaz. (rye)

Disease Period:

- ✓ Spring wheat: Check July I – July 25
- ✓ Winter wheat: Check July 28 – July 11
- ✓ Barley & Oats: Check June 28 – July 17

Occurrence - Widespread.

Symptoms - Look for small, oval, yellow-brown pustules on barley leaves; oval, orange-brown pustules on rye leaves; and oval orange-yellow pustules on wheat leaves.

Control - Use resistant varieties. Foliar fungicides are available but respond best to when disease is detected early and treatment is applied before disease is severe. Protect the flag leaf and prevent disease from progressing to the upper canopy.

STEM RUST……..

Puccinia graminis Pers.:Pers. f. sp. *tritici* Eriks. & E. Henn. (wheat/durum, barley, rye)
P. graminis f.sp. *avenae* Pers. (oats)
P. graminis f.sp. *secalis* Pers. (barley, rye)

Disease Period:

- ✓ Spring wheat: Check July 1 – July 25
- ✓ Winter wheat: Check June 28 – July 11
- ✓ Barley, Oats, & Rye: Check June 28 – July 17

Occurrence - Rare (few cultivars are susceptible to current races).

Symptoms - Look for brick-red pustules with ragged edges on all above-ground parts of oats, rye, and wheat.

Control - Use resistant varieties. Foliar fungicides are available but require early disease detection and treatment.

STRIPE RUST……..

Puccinia striiformis f.sp. *tritici* Westend. (wheat)

Disease Period:

- ✓ Spring wheat: Check June 15 – July 25
- ✓ Winter wheat: Check June 1 – July 15

Occurrence - Frequent (severity varies widely from year to year).

Symptoms - Look for small yellow pustules arranged in rows (stripes) on leaves of wheat. Glumes may become infected, resulting in significant yield losses.

Control - Use resistant varieties. Foliar fungicides are available and efficacious. Early recognition and treatment offers the best response. Up to 30% yield response has been observed in recent years on susceptible cultivars in epidemic years.

TAN SPOT, SEPTORIA LEAF BLOTCH & OTHER LEAF SPOT DISEASES…….

Pyrenophora tritici-repentis (Died.) Drechs. (tan spot of wheat/durum)
P. teres (net blotch barley)
Septoria tritici, S. avenae, Stagnospora nodorum (Septoria complex of wheat)
Septoria tritici (Septoria leaf blotch of rye)
Septoria passerinii, S. avenae f.sp. *triticea* (Septoria complex of barley)
Septoria avenae f.sp. *avenae* (Septoria diseases of oats)
Cochliobolus sativum (spot blotch of wheat and barley)

Disease Period:

- ✓ Spring wheat: Check June 1 – July 25
- ✓ Winter wheat: Check May 15 – July 11
- ✓ Barley & Oats: Check June 15 – July 17

Occurrence - Widespread.

Symptoms - Look for yellow, tan, or brown spots on lower leaves, usually small but enlarging with time. On wheat there is often an initial outbreak around Memorial Day.

Control - Foliar fungicides are available but require early disease detection and treatment. Hot, dry weather often stops or slows disease development while rainy or humid weather increases disease spread and severity.

SCAB (Fusarium Head Blight)……..

Fusarium graminearum Schwabe, Group II
(teleomorph = *Gibberella zeae*)

Disease Period:

- ✓ Spring wheat: Check July 1 – July 25
- ✓ Winter wheat: Check June 15 – July 11
- ✓ Barley: Check June 20 – July 17
- ✓ Rye: Check June 10 – July 10
- ✓ Oats: Check June 25 – July 25

Occurrence - East river counties - common; West river counties - rare.

Symptoms - Look for premature ripening (bleaching) of individual spikelets in green heads 2 to 3 weeks after flowering. After rainy periods pink spore masses can sometimes be seen on the inside bases of bleached spikelets. Outbreaks are favored by warm, wet weather for the two weeks preceding flowering and continuing through anthesis.

Control - Rotate to avoid planting wheat, barley, or rye into corn, sorghum, or wheat stubble, especially reduced tillage fields. Do not irrigate just prior to or during flowering. Spring tillage will decrease the risk of disease. Plow corn and sorghum fields in the fall. Use fungicides as allowed by current labels.

LOOSE SMUT……..

Ustilago tritici (Pers.) Rostr. (wheat, rye)
U. nuda (C.N. Jensen) Rostr., nom. nud. (barley)
U. avenae (Pers.) Rostr. (oats)

Disease Period:

- ✓ Winter wheat & Rye: Check June 1 – July 20
- ✓ Spring wheat, Oats & Barley: Check June 15 – July 20

Occurrence - Common (typically present at less than 2% incidence in a given field).

Symptoms - Look for dusty, brown to dark brown or black spore masses instead of spikelets on the head rachis.

Control - Grow resistant varieties or treat seed with a systemic seed treatment fungicide. Barley seed can be tested for loose smut with an embryo test. Seed lots with greater than 2% loose smut infection should be treated with a fungicide. Wheat, rye, and barley require a systemic fungicide. Oats will respond to any seed treatment.

COVERED SMUT and COMMON BUNT……

Tilletia tritici (Bjerk.) G. Wint. in Rabenh. (wheat)
(synonym = *T. caries* (DC.) Tul. & C. Tul.)
T. laevis Kühn in Rabenh. (wheat)
(synonym = *T. foetida* (Wallr.) Liro)
Ustilago hordei Pers.) Lagerh. (barley)
U. segetum (Bull.:Pers.) Roussel (oats)
(synonym = *U. kolleri* Wille)

Disease Period:

- ✓ Winter wheat & Rye: Check June 1 – July 20
- ✓ Spring wheat, Oats & Barley: Check June 15 – July 20

Occurrence - Fairly common (typically low incidence).

Symptoms - Look for dark brown or black spore masses enclosed by a grayish white membrane in place of healthy kernels in affected heads of barley and oats. In rye and wheat smutted heads are more slender than healthy ones and glumes may be spread apart; smutted kernels are about the same size as healthy seed but are light brown in color and more round; the smutted kernels, when ruptured, release masses of dark brown to black spores.

Control - Grow resistant varieties or treat seed with a fungicide. Any contact fungicide will provide adequate control of seed-borne bunt. Soil-borne bunt requires a systemic seed treatment fungicide for control.

TAKE-ALL……

Gauemanomyces graminis (Sacc.) Arx & D. Olivier var. *tritici* J. Walker (wheat)

Disease Period:

- ✓ Winter wheat: Check June 15 – July 20

Occurrence - Rare.

Symptoms - Look for white heads on prematurely ripe plants, premature death of plants in irregularly shaped clusters, or plants which pull up easily because the roots and crowns are severely rotted.

Control - Destroy volunteer winter wheat, use crop rotation, and avoid applying slow release forms of nitrogen.

COMMON ROOT ROT……

Bipolaris sorokiniana (Sacc.) Shoemaker (wheat, barley, oats, rye)
(teleomorph: *Cochliobolus sativus* (Ito & Kuribayashi) Drechs. ex Dast.

Disease Period:

- ✓ Winter wheat & Rye: Check June 28 – July 20
- ✓ Spring wheat, Barley, & Oats: Check July 15 – August 15

Occurrence - Widespread.

Symptoms - Look for stunting, white heads on prematurely ripe plants, premature death of plants in irregularly shaped clusters, or plants which pull up easily because the roots and crowns are severely rotted.

Control - Destroy volunteer winter wheat, use crop rotation, and avoid applying slow release forms of nitrogen.

DRYLAND ROOT AND CROWN ROT……

Fusarium spp. (wheat, barley, oats, rye)

Disease Period:

- ✓ Winter wheat & Rye: Check June 28 – July 20
- ✓ Spring wheat, Barley, & Oats: Check July 15 – August 15

Occurrence - Widespread (most serious on winter wheat).

Symptoms - Look for stunting, white heads on prematurely ripe plants, premature death of plants in irregularly shaped clusters, or plants which pull up easily because the roots and crowns are severely rotted. Crowns have white to pink, punky rot.

Control - Destroy volunteer winter wheat, control grassy weeds in fallow, use crop rotation, and avoid applying slow release forms of nitrogen.

WHEAT STREAK MOSAIC……

Wheat streak mosaic virus (WSMV potyvirus)

Disease Period:

- ✓ Winter wheat: Fall check prior to October 1 (rarely expresses in Fall)
  Spring check May 10 – June 30
- ✓ Spring wheat: June 15 – July 15

Occurrence - Frequent.

Symptoms - Look for yellow streaks on older leaves and light green streaks in young leaves. As the disease progresses, streaks may become necrotic.

Control - Destroy nearby volunteer winter wheat. Plant resistant or tolerant varieties.

BARLEY YELLOW DWARF (RED LEAF OF OATS)…….

Barley yellow dwarf virus (BYDV luteovirus)

Disease Period:

- ✓ Barley, Spring wheat, & Oats: Check June 1 – July 7
- ✓ Winter wheat: Check May 1 – June 30

Occurrence - Common.

Symptoms - Look for stunted plants with yellow leaf tips on wheat and barley. On oats the yellow leaf tips later turn various shades of yellow-red, orange, red, or reddish-brown. On oats, heads of diseased plants may have many blasted spikelets.

Control - Grow resistant or tolerant barley and wheat varieties. Grow tolerant oat varieties. Provide good soil fertility. Destroy volunteer winter wheat. To avoid WSM, plant winter wheat after September 15. Losses will be greater on fall infected winter wheat when followed by a dry spring. Spring wheat shows more disease in years with large spring aphid flights.

Alfalfa (*Medicago sativum* L.)

BACTERIAL WILT……..

Clavibacter michiganensis subsp*. insidiosus* (McCulloch 1925) Davis et al. 1984

Disease Period:

- ✓ Check June 7 – August 7

Occurrence - Rare.

Symptoms - Look for dwarfed, bunchy plants that grow slowly after cutting. Leaves turn yellow at the margin first, then entirely. Plants wilt during hot, dry conditions. Crowns and taproots show a yellow to tan discoloration of the vascular tissue. Disease is more severe in low-lying, poorly drained areas, or under irrigation.

Control - Grow resistant cultivars. Do not mow when plants are wet. Harvest young stands before old stands when using the same equipment.

ANTHRACNOSE…….

Colletotrichum trifolii Bain & Essary

Disease Period:

- ✓ Check July 1 – September 1

Occurrence - Rare.

Symptoms - Look for wilted, yellow, or light brown dead shoots scattered throughout the field. Shoots have a curled, shepherd's crook appearance. Large, diamond-shaped lesions with light tan or bleached centers and brown borders are formed on lower stem sections and on old cut stems. Small, black bumps with minute

spines form in the center of the lesions. Crowns are weakened, may turn black, and die. Disease is favored by warm, moist weather, or irrigation.

Control - Plant resistant cultivars. Clean all harvesting equipment between fields during the season.

PYTHIUM SEED ROT & DAMPING OFF……

Pythium debaryanum Auct. non R. Hesse
P. irregulare Buisman
P. splendens H. Braun
P. ultimum Trow

Disease Period:

✓ Check shortly after planting through emergence. Risk is greatest for about 14 days after planting.

Occurrence - Widespread.

Symptoms - Look for poor emergence; reduced stands; post-emergence death of young seedlings; and soft, rotted, brown roots on young seedlings. Moist, cool soil conditions favor disease. Seedlings become resistant after 6 weeks.

Control - Treat seed with metalaxyl or mefenoxam. Schedule planting for maximum early seedling growth.

COMMON LEAF SPOT……

Pseudopeziza medicaginis (Lib.) Sacc.

Disease Period:

✓ Check May 20 – June 15

Occurrence - Common.

Symptoms - Look for small, circular, brown to black spots with rough margins on lower leaflets. Small, light brown, raised fruiting bodies of the fungus can be seen in the center of the spots with a hand lens. Infected leaflets turn yellow and drop off.

Control - Grow resistant varieties. Harvest early before infected leaflets drop to maintain quality hay.

FUSARIUM WILT……

Fusarium oxysporum Schlechtend.:Fr. f. sp. *medicaginis* (Weimer) W. C. Snyder & H. N. Hans.

Disease Period:

✓ Check May 20 – June 15

Occurrence - Common.

Symptoms – Stunting associated with reddish brown discoloration in the vascular tissue of the tap root.

Control - Grow resistant varieties.

SPRING BLACK STEM & LEAF SPOT.....

Phoma medicaginis Malbr. & Roum. in Roum.

Disease Period:

✓ Check May 1 – June 10

Occurrence - Widespread.

Symptoms - Look for numerous small, black to dark brown spots on lower leaves, petioles, and stems. Spots enlarge and coalesce. Leaves turn yellow, wither, and drop off. Spots on stems enlarge, girdle stems, and blacken large areas near the crown. Usually severe only in the spring prior to the first cutting.

Control - Harvest first cutting early before infected leaflets drop.

SUMMER BLACK STEM & LEAF SPOT.....

Cercospora medicaginis Ellis & Everh.

Disease Period:

✓ Check July 1 – August 7

Occurrence - Common.

Symptoms - Look for small, brown spots that enlarge to form circular, reddish-brown to smoky-brown spots 2 to 6mm in diameter, often with light green to yellow borders. Elongate, brown spots form on the stems. Small stems may be girdled and die. Leaves wither, die, and may drop.

Control - Harvest on time or slightly early.

PHYTOPHTHORA ROOT ROT.....

Phytophthora medicaginis Drechs.
P. megasperma Drechs. f. sp. *medicaginis* T. Kuan & D.C. Erwin

Disease Period:

✓ Check July 1 – August 7

Occurrence - Fairly common.

Symptoms - Stunting and/or plant mortality in low areas of field where water stands. Damaged plants may have girdled taproot at same depth as water table in soil.

Control - Resistant varieties, harvest on time or slightly early. Promote better drainage.

VERTICILLIUM WILT.....

Verticillium albo-atrum Reinke & Berthier
V. dahliae Kleb.

Disease Period:

✓ Check May 20 – June 15

Occurrence - Common.

Symptoms – Plans are stunted. Yellow 'V' shapes may develop at the tip of leaves**.** Leaves may curl along midrib and turn a pinkish color. Stems will remain green after leaves die.

Control - Grow resistant varieties. Harvest early before infected leaflets drop. Clean farm equipment between fields, and mow younger fields before older to prevent spore transfer on mower blades. Sanitize cutter bar with 10% bleach.

ROOT and CROWN ROT COMPLEX……..

Fusarium acuminatum Ellis &Everh.
F. avenaceum (Fr.: Fr.) Sacc.
F. oxysporum Schlectend.: Fr.
F. solani (Mart.) Sacc.
Phoma medicaginis Malbr. & Roum. in Roum.
Pythium spp.
Rhizoctonia solani Kühn
Thielaviopsis basicola (Berk. & Broome) Ferraris

Disease Period:
✓ Check May 20 – June 15

Occurrence - Common.

Symptoms - Stunting of plants. Red to reddish brown discoloration inside the root that becomes more severe with age of stand.

Control - Grow resistant varieties. Harvest early before infected leaflets drop.

STEM NEMATODE……..

Ditylenchus dipsaci (Kühn) Filipjev

Disease Period:
✓ Check May 20 – June 15

Occurrence - Rare and restricted to Western South Dakota.

Symptoms - Stunting in early spring in established alfalfa stands. Patches of stunted plants may have crinkled, twisted and deformed "mouse ear" sized leaves. Stunted plants may have swollen nodes and shortened internodes. Infected stems become brittle and break off easily at the crown. Some plants may have a few completely white stems.

Control - Rotate alfalfa with small grains, sorghum, corn, cotton, and soybean to reduce stem nematode populations. Rotations longer than three years are best. Control volunteer alfalfa during rotation period. Plant resistant varieties.

Corn (*Zea mays* L.)

GOSS'S BACTERIAL WILT & BLIGHT……

Clavibacter michiganensis ssp. *nebraskensis* (Vidaver & Mandel) Davis et al.

Disease Period:

✓ Check corn May 20 – August 31

Occurrence - Rare.

Symptoms - Look for yellow to gray-green streaks parallel to the veins on the leaves. Droplets of bacteria form on the leaf surface at the margins of the streaks and dry into flaky spots with a crystalline sheen. Seedlings can wilt, wither, and die. Older plants are stunted and wilt. The vascular bundles in the lower stalk may be discolored and an orange bacterial exudate may ooze out of them. A slimy brown rot of the lower stalk may occur. The disease is particularly severe on irrigated corn.

Control - Plant resistant hybrids; plow under infested corn stalks in the fall. Rotate crops.

HOLCUS SPOT……

Pseudomonas syringae pv. *syringae* van Hall

Disease Period:

✓ Check corn June 10 – July 30

Symptoms - Look for round to oval, dark green, water-soaked spots on leaves. Later, these spots dry up and turn tan to brown with a reddish border. The disease is rarely severe.

Control - Grow resistant or tolerant hybrids and rotate crops.

SEED and SEEDLING BLIGHT (DAMPING OFF)……

Bipolaris sorokiniana (Sacc.) Shoemaker
B. zeicola (G.L. Stout) Shoemaker (*Helminthosporium carbonum* Ullstrup)
Diplodia maydis (Berk.) Sacc.
Exserohilum pedicillatum (A.W. Henry) K.J. Leonard & E.G. Suggs
E. turcicum (Pass.) K.J. Leonard & E.G. Suggs (*H. turcicum* Pass.)
Fusarium avenaceum (Fr.:Fr.) Sacc.
F. culmorum (Wm. G. Sm.) Sacc.
F. moniliforme J. Sheld.
Gibberella zeae (Schwein.) Petch (anamorph: *F. graminearum* Schwabe)
Penicillium spp.
Phomopsis sp.
Pythium spp.
Rhizoctonia solani Kühn

Disease Period:

✓ Check corn and sorghum May 15 – June 15

Symptoms - Look for poor emergence, rapid seedling wilt, and root rot on weak seedlings.

Control - Plant seed treated with a fungicide; plant high germination seed in warm, moist soil.

STALK ROT COMPLEX……

Diplodia maydis (Berk.) Sacc.
Gibberella zeae (Schwein.) Petch (anamorph: *Fusarium graminearum* Schwabe)
Colletotrichum graminicola (Ces.) G.W. Wils.
Fusarium subglutinans (Wollenweb. & Reinking)P.E. Nelson et al.
(*F. moniliforme* J. Sheld. var. *subglutinans* Wollenweb. & Reinking)
F. avenaceum (Fr.:Fr.) Sacc.
(teleomorph: *Gibberella avenacea* R.J. Cooke)

Disease Period:

✓ Check corn and sorghum September 20 – October 20

Symptoms - Check for stalk rot by pinching the lower two internodes of the stalk or by pushing the plant at ear level 10 to 15 inches from vertical. If the stalk is easily crushed when pinched or breaks when bent, count that plant as stalk rotted.

Control - None. If 10 to 15% show symptoms, harvest early.

MAIZE DWARF MOSAIC……

Maize dwarf mosaic virus (MDMV potyvirus)

Disease Period:

✓ Check late planted corn and sorghum June 15 – July 31

Occurrence - Common (typically at low incidence).

Symptoms - Look for light green streaks in the young leaves of corn for strains A & B of the virus, and for red streaks and light green streaks on the young leaves of sorghum for strain A of the virus.

Control - Plant resistant hybrids.

GRAY LEAF SPOT……

Cercospora zeae-maydis Tehon & E.Y. Daniels

Disease Period:

✓ Check July 15 – August 15

Occurrence - Fairly common.

Symptoms - Rectangular spots develop on lower leaves and spread upward in the canopy.

Control - Plant resistant varieties. Fungicides as needed. Tillage will reduce inoculum. Crop rotation. Studies in South Dakota have shown the best response to fungicides with a single application at tasseling.

NORTHERN CORN LEAF BLIGHT……..

Setosphaeria turcica (Luttrell) K.J. Leonard & E.G. Suggs
(anamorph: *Exserohilum turcicum* (Pass.) K.J. Leonard & E.G. Suggs)
(synonym = *Helminthosporium turcicum* Pass.)

Disease Period:

✓ Check July 15 – August 15

Occurrence - Occasional.

Symptoms - Large cigar-shaped lesions develop on lower leaves and spread upward in the canopy. Large areas of leaf tissue can be consumed in a short time.

Control - Plant resistant varieties. Fungicides as needed. Tillage will reduce inoculum. Crop rotation.

EYESPOT……..

Aureobasidium zeae (Narita & Hiratsuka) J.M. Dingley
(synonym = *Kabatiella zeae* Narita & Hiratsuka)

Disease Period:

✓ Check July 15 – August 15

Occurrence - Occasional.

Symptoms - Small transparent spots develop, often on new growth and spread upward in the canopy.

Control - Plant resistant varieties. Tillage will reduce inoculum. Crop rotation.

ANTHRACNOSE……..

Colletotrichum graminicola (Ces.) G.W. Wils.
(teleomorph: *Glomerella graminicola* Politis)

Disease Period:

✓ Check June 15 – August 15

Occurrence - Occasional.

Symptoms - small to medium sized spots with dark borders develop on lower leaves and spread upward in the canopy. The whorl of new growth may die and a stalk rot may develop.

Control - Plant resistant varieties. Tillage will reduce inoculum. Crop rotation. Irrigation can increase disease severity.

Flax (*Linum usitatissimum* L.)

ANTHRACNOSE……..

Colletotrichum lini (Westerdijk) Tochinai

Disease Period:

✓ Check May 15 – June 10 and June 25 – July 31

Occurrence - Occasional.

Symptoms - Look for a reddish canker on the lower stem at or below the soil line. Infected young seedlings (2 to 4 inches tall) are stunted and may die. On older plants check fields after heavy rains and lodging. Look for cankers on the stem with dark, raised bumps in the cankers. The raised bumps will appear to have minute, black spines.

Control - Plant resistant varieties; rotate crops.

FUSARIUM WILT…….

Fusarium oxysporum Schlechtend.:Fr. f. sp. *lini* (Bolley) W.C. Snyder & H.N. Hans.

Disease Period:

✓ Check until plants are 30 days old.

Occurrence - Common.

Symptom - Look for wilting and death of young seedlings. Stems and leaves wilt, turn brown, and dry up. Stems become constricted at the soil line and fall over. Soil temperatures 77ºF or higher plus dry soil conditions favor wilt.

Control - Plant resistant varieties.

PASMO……..

Septoria linicola (Speg.) Garassini

Disease Period:

✓ Check fields shortly before flowering.

Occurrence - Occasional.

Symptoms - Look for circular, greenish-yellow to dark brown spots on lower leaves. Small, black specks develop in older spots on leaves. Infected leaves wither. Small, brown spots develop on the stem and form bands around the stem, giving it a mottled appearance. Small black specks develop in the bands. Stems turn brown and leaves drop off.

Control - Plant as early as possible and use a seed treatment fungicide.

ASTER YELLOWS……

Aster yellows (AY) phytoplasma

Disease Period:

✓ Check during flowering

Occurrence - Occasional.

Symptoms - Diseased plants are stunted and yellow. Flowers are distorted with petals remaining green and leaf-like. No seed is set on infected branches. Disease is severe after leafhopper invasions.

Control - None.

RHIZOCTONIA SEEDLING BLIGHT & ROOT ROT……

Rhizoctonia solani Kühn

Disease Period:

✓ Check May 1 – June 15

Occurrence - Common.

Symptoms - Look for yellowing, wilting, and premature death of young seedlings; roots will have reddish-brown spots and will eventually shrivel and turn dark brown or black. Warm, moist soil conditions shortly after emergence favor disease.

Control - Plant as early as possible and use a seed treatment fungicide.

Soybean (*Glycine max* (L.) Merrill)

BROWN SPOT……

Septoria glycines Hemmi
(teleomorph = *Mycosphaerella usoenskajae* Mashk & Tomil)

Disease Period:

✓ Check 2 to 3 weeks after emergence.

✓ Recheck June to July, as the canopy closes.

Occurrence - Widespread.

Symptoms - Look for irregular, light to dark brown, minute spots on the unifoliate leaves and on the first trifoliate leaves. Leaves yellow and drop off. Spots may form on the main stem, branches, petioles, and pods. During warm, wet weather the disease spreads from lower to upper leaves. Dry weather halts the spread of the disease up the plant.

Control - Rotate crops; plow infested soybean fields; use foliar fungicides.

BACTERIAL BLIGHT……..

Pseudomonas syringae pv. *glycinea* (Coerper 1919) Young, Dye & Wilkie 1978

Disease Period:

✓ Check 3 to 7 days following windy rainstorms in June

Occurrence - Widespread.

Symptoms - Look for small, angular water-soaked spots on the lower leaves. These spots later turn yellow then brown to black in the center, leaving a yellow border. Gradually, the entire leaf turns yellow. The brown spots enlarge into blotches that tear and fall out after windy weather, giving the leaves a ragged appearance. Cool (70ºF), rainy weather favors spread of the disease from lower to upper leaves.

Control - Rotate crops; plow soybean fields to reduce soybean residue.

PYTHIUM DAMPING OFF & SEED DECAY……...

Pythium aphanidermatum (Edison) Fitzp.
P. debaryanum Auct. non R. Hesse
P. irregulare Buisman
P. myriotylum Drechs.
P. ultimum Trow

Disease Period:

✓ Check 1 to 2 weeks after planting

Occurrence - Widespread.

Symptoms - Look for delayed emergence, rotted seed in the furrow, baldheads (cotyledons emerge but the growing point is dead), and weak seedlings that wilt during dry periods. Roots will appear brown, soft, and rotted. Severe in heavy textured soils, wet soils, and low spots in fields.

Control - Plant high germination seed; treat seed with metalaxyl/mefenoxam.

FUSARIUM ROOT ROT……

Fusarium spp.

Disease Period:

✓ Check June 15 – July 20

Occurrence - Occasional.

Symptoms - Look for stunted, weak seedlings; dark brown, firm lesions on the taproot and lower stems; and wilting and death of plants when weather turns hot and dry. Pink or orange spore masses can sometimes be seen on the stem near the soil line. Infection is favored by cool, wet soil conditions shortly after planting.

Control - Cultivate so a ridge of soil is thrown up against the base of the plants. Use a seed treatment fungicide.

RHIZOCTONIA ROOT ROT.....

Rhizoctonia solani Kühn

Disease Period:

✓ Check June 15 – July 20

Occurrence - Widespread.

Symptoms - Look for stunted, weak seedlings; and reddish-brown sunken lesions on the taproot and lower stem near the soil line. Infected plants can wilt and die during hot, dry weather.

Control - Cultivate so a ridge of soil is thrown up against the base of the plants. Use a seed treatment fungicide.

PHYTOPHTHORA ROOT and STEM ROT.....

Phytophthora sojae Kaufmann & Gerdemann

Disease Period:

✓ Check June 15 – July 20

Occurrence - Widespread.

Symptoms - Look for brown discoloration of lower stem extending up the stem about 6 inches; roots may be brown and rotted; plants may yellow and wilt rapidly. Infected plants are commonly found in low areas in poorly drained, wet, compacted soils.

Control - Plant resistant varieties; treat seed with metalaxyl/mefenoxam.

DOWNY MILDEW.....

Peronospora manshurica (Naumov) Syd. In Gaum.

Disease Period:

✓ Check from planting – August 20

Occurrence - Common.

Symptoms - Look for pale green to light yellow spots on young leaves. Spots enlarge to form irregular yellow blotches that later turn grayish-brown with a yellowish-green border. In early morning after heavy dews, grayish to pale purple tufts of fungal growth can be found on the bottom side of leaves. Leaves can turn yellow, then brown and drop off. Disease is favored by high humidity and cool temperatures (65-75ºF).

Control - Plant resistant varieties, rotate crops, and plow soybean fields.

POD & STEM BLIGHT.....

Diaporthe phaseolorum (Cooke & Ellis) Sacc. var. *sojae* (Lehman) Wehm.

Disease Period:

✓ Check July 15 – August 20

Occurrence - Widespread with late season development rarely resulting in yield loss.

Symptoms - Look for small, black specks on the main stem, lower branches, and pods. The specks are often aligned in rows up and down the stem. Heavily infected seeds at maturity will be shriveled, cracked, and frequently covered with a white fungal growth. Warm, wet weather at flowering and pod-fill favor the disease.

Control - Rotate crops, plow soybean fields, and harvest seed on time.

NORTHERN STEM CANKER……..…….

Diaporthe phaseolorum (Cooke & Ellis) Sacc. var. *caulivora* Athow & Caldwell

Disease Period:

✓ Check July 10 – August 20

Occurrence - Frequent.

Symptoms - Look for a slightly sunken, reddish-brown to dark brown canker up to 3 inches long on the stem, generally centered at one of the first five nodes on the stem. Stem tissue above and below the canker remains green. Small, black specks are scattered randomly throughout older cankers. Infected plants often die prematurely.

Control - Rotate crops and plow soybean fields.

SOYBEAN MOSAIC……

Soybean mosaic virus (SMV potyvirus)

Disease Period:

✓ Check May 15 – June 30

Occurrence - Rare.

Symptoms - Look for weak, spindly seedlings with rugose or crinkled unifoliate leaves that become mottled and prematurely yellow. The trifoliate leaves are puckered downward, stunted, mottled, rugose, and will turn yellow prematurely. Early infected plants are stunted, with shortened petioles and internodes. Symptoms are more severe when temperatures have been cool (less than 75ºF). Seeds from severely infected plants may be mottled brown or black, and slightly smaller than healthy seeds.

Control - Plant high quality disease-free seed, and rogue out infected plants from seed production fields. Control aphid vectors.

BEAN POD MOTTLE……..

Bean pod mottle virus (BPMV SoBeMoVirus)

Disease Period:

✓ Check May 15 – June 30

Occurrence - Widespread.

Symptoms - Rugose, crinkled leaves generally express about mid summer. The trifoliate leaves may cup upward or downward. Plants may be stunted and mottled. Early infected plants are more likely to have mottled seed. Often infected plants have fewer stems and branches with severe yield loss reaching 60% in South Dakota.

Control - Plant high quality disease-free seed, and rogue out infected plants from seed production fields. Control bean leaf beetle vectors.

SOYBEAN CYST NEMATODE……..……..

Heterodera glycines Ichinohe

Disease Period:

✓ Check July 15 – August 30

Occurrence - Widespread in south eastern counties. Scattered in other soybean producing areas.

Symptoms - Look for yellow, stunted plants in patches. Don't confuse with drowned out areas. Submit root and soil sample for nematode assay.

Control - Plant resistant varieties and rotate to non-host crops.

ASIAN SOYBEAN RUST……

Phakopsora pachyrhizae Syd.

Disease Period:

✓ Check July 15 – August 30

Occurrence - Not reported in state as yet.

Symptoms - Pale-colored pustules develop in the lower canopy and spread upward leading to premature defoliation of the crop. Early symptoms are not obvious. Later symptoms cause mottle on leaves with many pustules forming on lower leaf surface.

Control - Fungicides applied in a preventative or early curative mode between flowering and full seed crop stage.

BROWN STEM ROT (BSR) …….

Phialophora gregata (Allington & D.W. Chamberlain) W. Gams

Disease Period:

✓ Check July 15 – September 15

Occurrence - Occasional in areas or fields with neutral to acid pH.

Symptoms - Always causes a brown discoloration in the pith of the lower stem. Discoloration often begins at the nodes and eventually fills in the internodal areas. Two strains of the pathogen occur in South Dakota and only one causes interveinal necrosis symptoms on the leaves. In dry conditions, leaf symptoms may be suppressed.

Control - Choose resistant or shorter season cultivars. Practice crop rotation and bury crop residue. Do not irrigate after flowering.

CHARCOAL ROT……

Macrophomina phaseolina (Tassi) Goidanich

Disease Period:

✓ Check during drought periods in August and September

Occurrence - Occasional. Documented to occur on soybeans in extreme southeastern counties. Favored by moisture in the spring followed by hot dry summer weather.

Symptoms - Irregular areas of wilting or premature death of plants from drought stress. Grayish discoloration of the lower stem due to aggregations of microsclerotia may develop late in the season.

Control - Practice crop rotation. Reduce seeding rates. Maintain adequate fertility.

FROGEYE LEAF SPOT ……

Cercospora sojina K. Hara

Disease Period:

✓ Check July and August

Occurrence - Rare in South Dakota. This disease has only been observed in the extreme southeastern counties.

Symptoms - Angular spots with light gray centers and distinct purple to red-brown margins. No chlorotic halos surrounding lesions are present. Leaf spots can coalesce to form large lesions resulting in premature leaf drop.

Control - Plant pathogen free seed to avoid introducing the disease. Plant resistant varieties. Avoid planting successive soybean crops and bury residue to lower inoculum levels and reduce disease.

SUDDEN DEATH SYNDROME (SDS) ……

Fusarium solani (Mart.) Sacc. f. sp. glycines

Disease Period:

✓ Check July 15 – September

Occurrence - Rare. SDS has only been observed in Clay County of South Dakota.

Symptoms - Interveinal chlorosis, yellow blotches between the veins, progress to large irregular patches. Yellowed patches turn brown and die, while the veins remain green. Symptoms are more pronounced on top leaves. Infected leaves drop but the petioles remain on the stems. Pod drop may also occur. Symptoms are very similar to BSR, but no stem browning develops. SDS conversely may cause a root rot. Infection is favored by cool, moist soils.

Control - Plant resistant varieties. Plant when soil is warm. Reduce soybean cyst nematode populations. Rotate soybeans and maintain adequate fertility.

Sunflower (*Helianthus annuus* L.)

APICAL CHLOROSIS……

Pseudomonas syringae pv. *tagetis* (Hellmers) Young *et al.*

Disease Period:

✓ Check July 1 – July 31

Occurrence - Infrequent.

Symptoms - Look for young plants that are yellow, particularly the youngest leaves and the growing point. Infected plants eventually turn green and continue to grow.

Control - None.

ALTERNARIA LEAF & STEM SPOT……...

Alternaria helianthi (Hansf.) Tubaki & Nishihara
A. tenuissima (Kunze:Fr.) Wiltshire
A. zinniae M.B. Ellis

Disease Period:

✓ Check August 1 – September 15

Symptoms - Look for circular, dark brown to black spots on leaves and brown to black spots or streaks on stems, petioles, and back of heads. Defoliation can occur.

Control - Rotate crops.

PHOMA BLACK STEM……...

Phoma macdonaldi Boerema
(teleomorph: *Leptosphaeria lindquistii* Frezzi)

Disease Period:

✓ Check July 20 – September 10

Symptoms - Look for large, dark brown to black lesions on the stem and centered where the leaf attaches to the stem. These lesions enlarge to form irregular-shaped, black blotches with definite margins. Lodging can occur late in the season.

Control - Rotate crops.

DOWNY MILDEW……

Plasmopara halstedii (Farl.) Berl. & De Toni in Sacc.

Disease Period:

✓ Check 1 to 3 weeks after emergence.

Symptoms - Look for stunted plants with light green to yellowish-green discoloration of leaves. White, cottony masses of fungal growth can be seen on the lower leaf surface of infected leaves in the early morning after heavy dews. Little or no seed is set in erect platform heads of infected plants.

Control - Plant resistant hybrids as available and treat seeds with metalaxyl/mefenoxam and azoxystrobin.

SCLEROTINIA WILT, STALK ROT, and HEAD ROT……

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:

✓ Check July 20 – August 31

Symptoms - Symptoms usually appear about flowering time following warm weather. Look for individual plants or groups of plants where the upper leaves have drooped (wilted) and dried up. Infected plants have a gray to brown canker girdling the base of the stem. Sometimes, a dense white mass occurs on the canker surface. Lodging occurs later in the season.

Control - Use long crop rotations, do not use soybeans in your crop rotation, deep plow infested fields.

PHOMOPSIS STEM CANKER……..

Phomopsis helianthi (Munt.- Cvet. et al.)

Disease Period:

✓ Check July 20 – August 31

Symptoms - Symptoms usually appear late in the season following warm wet weather. Leaf symptoms appear as long dark streaks theat follow major leaf veins. There may be V-shaped necrotic areas on the leaves. As the infection spreads down the leaf and into the stem, dry brown lesions will expand around the point of leaf attachment. The brownish canker can lead to early maturity if it girdles the stem. Lodging may be more severe in fields with Phomopsis stem canker.

Control - Use long crop rotations, plant resistant sunflower hybrids in your crop rotation and deep plow infested fields.

Canola (*Brassica napus* L. and *B. rapa* L.)

SCLEROTINIA STEM ROT (WHITE MOLD)……..

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:

✓ Check fields during early bloom - July 1 – July 15

✓ Recheck in windrows - July 20 – August 15

Occurrence - Common.

Symptoms - Infections begin as wet tissue breakdown on lower leaves. Infections progress into lower stem tissue where a bleached, white rot appears as the crop matures.

Control - Plant resistant varieties, rotate to non-susceptible crops (grains), scout for disease incidence. If wet weather is forecast during petal drop, consider the use of a fungicide at 20-30% bloom.

BLACKLEG……...

Leptosphaeria maculans (Desmaz.) Ces. and De Not
(anamorph = *Phoma lingam* (Tode:Fr.) Desmaz.)

Disease Period:

✓ Check in windrows - July 20 – August 15

Occurrence - Common.

Symptoms - Cankers form in association with lower nodes of the main stem. As cankers girdle the stem, the entire plant may die prematurely.

Control - Disease-free seed. Crop rotation. Tillage.

BLACKSPOT……

Alternaria brassicae (Berk.) Sacc.
A. brassicicola (Schwein.) Wiltshire

Disease Period:

✓ Check in windrows - July 20 – August 15

Occurrence - Common.

Symptoms - Small black flecks develop on pods and can coalesce to lead to dark discoloration of entire pod.

Control - No control.

ASTER YELLOWS……

Aster Yellows (AY) phytoplasma

Disease Period:

✓ Check in windrows - July 20 – August 15

Occurrence - Infrequent.

Symptoms - A bladder-like pod symptoms develops as a result of infection. Infection years are tied to leafhopper flights into the state.

Control - No control.

Safflower (*Carthamus tinctorius* L.)

DAMPING-OFF

Pythium spp.

Disease Period:

✓ Check 1 to 2 weeks after planting

Occurrence - Common.

Symptoms - Look for delayed emergence, rotted seed in the furrow, baldheads (cotyledons emerge but the growing point is dead), and weak seedlings that wilt during dry periods. Roots will appear brown, soft, and rotted. Severe in heavy textured soils, wet soils, and low spots in fields.

Control - Plant high germination seed; treat seed with metalaxyl/mefenoxam.

ALTERNARIA LEAF BLIGHT

Alternaria carthami Chowdhury

Disease Period:

✓ Check July 15 – August 30

Occurrence - Common.

Symptoms - Leaf spotting begins on lower leaves and spreads upward. Lesions may coalesce and consume lower leaves.

Control - Treat with foliar fungicide, as available, at early flowering.

SCLEROTINIA STEM ROT

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:

✓ Check July 20 – August 31

Symptoms - Symptoms usually appear about flowering time following warm weather. Look for individual plants or groups of plants where the upper leaves have drooped (wilted) and dried up. Infected plants have a gray to brown canker girdling the lower stem. Sometimes, a dense white mass occurs on the canker surface. Lodging may occur later in the season.

Control - Use long crop rotations, do not use soybeans in your crop rotation, deep plow infested fields.

Field Pea (*Pisum sativum* L.)

PYTHIUM DAMPING OFF & SEED DECAY.....

Pythium debaryanum Hesse
P. irregulare Buisman
P. ultimum Trow

Disease Period:
✓ Check 1 to 2 weeks after planting.

Occurrence - Widespread.

Symptoms - Look for delayed emergence, rotted seed in the furrow, baldheads (cotyledons emerge but the growing point is dead), and weak seedlings that wilt during dry periods. Roots will appear brown, soft, and rotted. Severe in heavy textured soils, wet soils, and low spots in fields.

Control - Plant high germination seed; treat seed with metalaxyl/mefenoxam.

FUSARIUM ROOT ROT.....

Fusarium solani (Mart.) Sacc. f. sp. *pisi* (F.R. Jones) W.C. Snyder & H.N. Hans.

Disease Period:
✓ Check June 15 – July 20

Occurrence - Occasional.

Symptoms - Look for stunted, weak seedlings; dark brown, firm lesions on the taproot and lower stems; and wilting and death of plants when weather turns hot and dry. Pink or orange spore masses can sometimes be seen on the stem near the soil line. Infection is favored by cool, wet soil conditions shortly after planting.

Control - Use a broad-spectrum seed treatment fungicide.

BACTERIAL BLIGHT.....

Pseudomonas syringae pv. *pisi* (Sackett 1916) Young, Dye & Wilkie 1978

Disease Period:
✓ Check 3 to 7 days following windy rainstorms in June

Occurrence - Widespread.

Symptoms - Look for small, angular water-soaked spots on the lower leaves. These spots later turn yellow then brown to black in the center, leaving a yellow border. Gradually, the entire leaf turns yellow. The brown spots enlarge into blotches that tear and fall out after windy weather, giving the leaves a ragged appearance. Cool (70ºF), rainy weather favors spread of the disease from lower to upper leaves.

Control - Pathogen-free seed. Seed treatments containing a bactericidal antibiotic have some influence on seed-borne inoculum.

SCLEROTINIA STEM ROT……

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:

✓ Check July 20 – August 31

Symptoms - Symptoms usually appear about flowering time following warm weather. Look for individual plants or groups of plants where the upper leaves have drooped (wilted) and dried up. Infected plants have a gray to brown canker girdling the lower stem. Sometimes, a dense white mass occurs on the canker surface. Lodging may occur later in the season.

Control - Use long crop rotations, do not use soybeans in your crop rotation, deep plow infested fields.

Chickpea (*Cicer arietinum* L.)

PYTHIUM DAMPING OFF & SEED DECAY……...

Pythium debaryanum Hesse
P. irregulare Buisman
P. ultimum Trow

Disease Period:

✓ Check 1 to 2 weeks after planting

Occurrence - Widespread.

Symptoms - Look for delayed emergence, rotted seed in the furrow and weak seedlings that wilt during dry periods. Roots will appear brown, soft, and rotted. Disease may be severe in heavy textured soils, wet soils, and low spots in fields.

Control - Plant high germination seed; treat seed with metalaxyl/mefenoxam.

FUSARIUM ROOT ROT……

Fusarium acuminatum Ellis & Everh.
F. arthrosporioides Sherb.
F. avenaceum (Corda:Fr.) Sacc.
F. equiseti (Corda) Sacc.
F. solani (Mart.) Sacc. f. sp. *eumartii* (C. Carpenter) W.C. Snyder & H.N. Hans.
(synonym = *F. eumartii* Carpenter)

Disease Period:

✓ Check June 15 – July 20

Occurrence - Occasional.

Symptoms - Look for stunted, weak seedlings; dark brown, firm lesions on the taproot and lower stems;

and wilting and death of plants when weather turns hot and dry. Pink or orange spore masses can sometimes be seen on the stem near the soil line. Infection is favored by cool, wet soil conditions shortly after planting.

Control - Cultivate so a ridge of soil is thrown up against the base of the plants. Use a seed treatment fungicide.

ASCOCHYTA BLIGHT……..

Ascochyta rabiei (Passerini) Labrousse
(teleomorph: *Mycosphaerella rabiei* Kovachevski)

Disease Period:
✓ Check June 15 – August 15

Occurrence - Common

Symptoms - Symptoms may appear soon after emergence as a seedling blight. Leaf spotting usually has a concentric ring pattern and may start in the seedling stage following periods of warm weather. Stem lesions may have a gray to brown canker girdling the lower stem.

Control - Use long crop rotations, do not use soybeans in your crop rotation. Deep plow infested fields.

SCLEROTINIA STEM ROT……

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:
✓ Check July 20 – August 31

Symptoms - Symptoms usually appear about flowering time following warm weather. Look for individual plants or groups of plants where the upper leaves have drooped (wilted) and dried up. Infected plants have a gray to brown canker girdling the lower stem. Sometimes, a dense white mass occurs on the canker surface. Lodging may occur later in the season.

Control - Use long crop rotations, do not use soybeans in your crop rotation and deep plow infested fields.

Lentil (*Lens culinaris* Medik.)

PYTHIUM DAMPING OFF & SEED DECAY……...

Pythium debaryanum Hesse
P. irregulare Buisman
P. ultimum Trow

Disease Period:
✓ Check 1 to 2 weeks after planting

Occurrence - Widespread.

Symptoms - Look for delayed emergence, rotted seed in the furrow, baldheads (cotyledons emerge but the growing point is dead), and weak seedlings that wilt during dry periods. Roots will appear brown, soft, and rotted. Severe in heavy textured soils, wet soils, and low spots in fields.

Control - Plant high germination seed; treat seed with metalaxyl/mefenoxam.

FUSARIUM ROOT ROT……

Fusarium solani (Mart.) Sacc.

Disease Period:

✓ Check June 15 – July 20

Occurrence - Occasional.

Symptoms - Look for stunted, weak seedlings; dark brown, firm lesions on the taproot and lower stems; and wilting and death of plants when weather turns hot and dry. Pink or orange spore masses can sometimes be seen on the stem near the soil line. Infection is favored by cool, wet soil conditions shortly after planting.

Control - Cultivate so a ridge of soil is thrown up against the base of the plants. Use a seed treatment fungicide.

ANTHRACNOSE……

Colletotrichum lindemuthianum (Sacc. & Magnus) Briosi & Cavara
C. truncatum (Schwein.) Andrus & Moore

Disease Period:

✓ Check July 1 – September 1

Occurrence - Rare.

Symptoms - Look for wilted, yellow, or light brown dead shoots scattered throughout the field. Shoots have a curled, shepherd's crook appearance. Large, diamond-shaped lesions with light tan or bleached centers and brown borders are formed on lower stem sections and on old cut stems. Small, black bumps with minute spines form in the center of the lesions. Crowns are weakened, may turn black, and die. Disease is favored by warm, moist weather, or irrigation.

Control - Plant resistant cultivars. Clean all harvesting equipment between fields during the season.

SCLEROTINIA STEM ROT (White Mold)…...……

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:

✓ Check July 20 – August 31

Occurrence - Infrequent.

Symptoms - Symptoms usually appear about flowering time following warm weather. Look for individual plants or groups of plants where the upper leaves have drooped (wilted) and dried up. Infected plants have a gray to brown canker girdling the lower stem. Sometimes, a dense white mass occurs on the canker surface. Lodging may occur later in the season.

Control - Use long crop rotations, do not use soybeans in your crop rotation and deep plow infested fields.

ASCOCHYTA BLIGHT……..

Ascochyta fabae Speg. f. sp. *lentis* Gossen, Sheard, Beauchamp & Morrall
(synonym = *Ascochyta lentis* Bond. & Vassil.)
(teleomorph: *Didymella* sp.)

Disease Period:

✓ Check June 15 – August 15

Occurrence - Common.

Symptoms - Symptoms may appear soon after emergence as a seedling blight. Leaf spotting usually has a concentric ring pattern and may start in the seedling stage following periods of warm weather. Stem lesions may have a gray to brown canker girdling the lower stem.

Control - Use long crop rotations, do not use soybeans in your crop rotation, deep plow infested fields.

Dry Bean (*Phaseolus vulgaris* L.)

PYTHIUM DAMPING OFF & SEED DECAY……...

Pythium debaryanum Hesse
P. irregulare Buisman
P. ultimum Trow

Disease Period:

✓ Check 1 to 2 weeks after planting

Occurrence - Widespread.

Symptoms - Look for delayed emergence, rotted seed in the furrow, baldheads (cotyledons emerge but the growing point is dead), and weak seedlings that wilt during dry periods. Roots will appear brown, soft, and rotted. Severe in heavy textured soils, wet soils, and low spots in fields.

Control - Plant high germination seed; treat seed with metalaxyl/mefenoxam.

FUSARIUM ROOT ROT……

Fusarium solani (Mart.) Sacc. f. sp. *phaseoli* (Burkholder) W. C. Snyder & H. N. Hans.

Disease Period:

✓ Check June 15 – July 20

Occurrence - Occasional.

Symptoms - Look for stunted, weak seedlings; dark brown, firm lesions on the taproot and lower stems; and wilting and death of plants when weather turns hot and dry. Pink or orange spore masses can sometimes be seen on the stem near the soil line. Infection is favored by cool, wet soil conditions shortly after planting.

Control - Cultivate so a ridge of soil is thrown up against the base of the plants. Use a seed treatment fungicide.

BACTERIAL BLIGHTS……

Brown spot - *Pseudomonas syringae* pv. *syringae* van Hall
Halo blight - *P. syringae* pv. *phaseolicola* (Burkholder) Young et al.
Common blight - *Xanthomonas axonopodis* pv. *phaseoli* (Smith) Vauterin et al.
(also known as *X. campestris* pv. *phaseoli* (Smith) Dye)

Disease Period:

✓ Check June 15 – August 15

Occurrence - Occasional.

Symptoms - Watersoaked lesions typically appear a few days after heavy rains. Halo blight and Brown spot tend to appear earlier in the yer under cool weather conditions while common blight is favored by warm weather. Common blight lesions will be surrounded by a bright, lemon-yellow halo. Brown spot occasionally has a small, dull-yellow halo in cool weather and halo blight can produce a large yellow halo around the lesions in cool weather.

Control - Pathogen-free seed. Seed treatments containing a bactericidal antibiotic have some influence on seed-borne inoculum.

ANTHRACNOSE……

Colletotrichum lindemuthianum (Sacc. & Magnus) Lams.-Scrib.
(teleomorph: *Glomerella lindemuthiana* Shear)

Disease Period:

✓ Check June 15 – September 1

Occurrence - Rare.

Symptoms - Look for wilting plants with diamond-shaped stem lesions with light tan or bleached centers and brown borders. Small, black bumps with minute spines form in the center of the lesions. Lesions may develop on pods as well. Disease is favored by warm, moist weather, or irrigation.

Control - Plant resistant cultivars. Plant disease free seed sources.

SCLEROTINIA STEM ROT (White Mold)……

Sclerotinia sclerotiorum (Lib.) de Bary

Disease Period:

✓ Check July 20 – August 31

Symptoms - Symptoms usually appear about flowering time following warm weather. Look for individual plants or groups of plants where the upper leaves have drooped (wilted) and dried up. Infected plants have a gray to brown canker girdling the lower stem. Sometimes, a dense white mass occurs on the canker surface. Lodging may occur later in the season.

Control - Use long crop rotations, do not use soybeans in your crop rotation and deep plow infested fields.

Plant Disease Terms

Blast: A failure to produce fruit or seeds, or the sudden death of buds, flowers, or young fruit.

Canker: A lesion on a stem, often swollen or sunken, surrounded by living tissues.

Coalesce: The coming together of two-or more lesions to form a large spot or blotch.

Fruiting body: Fungus structure containing or bearing spores.

Girdle: To kill by interrupting the circulation of water and nutrients.

Glumes: The pair of bracts at the base of a spikelet.

Hyphae: See mycelium.

Lesion: A localized area of diseased tissue of a host plant.

Membrane: A thin pliable layer of tissue covering surfaces or separating or connecting regions, structures, or organs of a plant.

Mycelium: The threadlike body of a fungus.

Pustule: A blister-like, frequently erumpent, spot or spore mass.

Rachis: The axis of a spike or raceme.

Rugose: Full of wrinkles.

Smut: The common name of diseases caused by fungi.

Spore: A minute propagative unit that functions as a seed, but differing from it in that a spore does not contain a pre-formed embryo.

SDSU

Access at http://agbiopubs.sdstate.edu/articles/ExEx8005.pdf

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the USDA. Gerald Warmann, Director of Extension, Associate Dean, College of Agriculture & Biological Sciences, South Dakota State University, Brookings. SDSU is an Affirmative Action/Equal Opportunity Employer (Male/Female) and offers all benefits, services, and educational and employment opportunities without regard for ancestry, age, race, citizenship, color, creed, religion, gender, disability, national origin, sexual preference, or Vietnam Era veteran status.

ExEx8005: 1,000 copies print at a cost of $0.00 each. June 2010.

South Dakota
Cooperative Extension Service

Access at http://agbiopubs.sdstate.edu/articles/ExEx8005.pdf

ExEx8005: 1,000 copies print at a cost of $0.00 each. June 2010.